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EXPLORING THE IMPACT AND CHALLENGES OF USING ARTIFICIAL INTELLIGENCE IN AN OPEN, DISTANCE AND DIGITAL EDUCATION UNIVERSITY: A CONCEPTUAL PAPER

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ABSTRACT

Artificial Intelligence (AI) is being more and more incorporated into the field of education, providing advancements in personalized learning, adaptive systems, and administrative efficiencies in Open, Distance and Digital Education (ODDE) University. The research is focused on discovering the benefits, such as enhanced personalization and automation, as well as drawbacks like excessive dependence on technology and worries about data privacy. A combination of methods will be used to gather data, including surveys, interviews, and document reviews with the university's faculty, students, and administrators. Predicted results indicate that although AI can improve learning experiences and make administrative tasks more efficient, it also brings about challenges such as infrastructure constraints, ethical concerns, and adaptation struggles for those involved. The consequences are significant for policymakers, educators, and students, offering guidance on how to successfully and ethically incorporate AI into ODDE University. Suggestions consist of enhancing technological infrastructure, providing thorough training for employees, and creating explicit guidelines on data privacy and utilization of AI. The research highlights the importance of a comprehensive approach that considers the viewpoints of all those participating. Additional studies are recommended to investigate the lasting impact and wider uses in various educational settings, with the goal of maximizing the advantages of AI while addressing any possible disadvantages in online learning.

Keywords: Artificial Intelligence, University, ODDE, Educational Technology, AI Challenges, AI Impact

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INTRODUCTION

Artificial Intelligence (AI) technology is making significant advances in different industries, such as education, where it is quickly changing the way learning environments and delivery methods operate. AI includes machines and systems created to imitate human intelligence in solving problems, making decisions, and engaging in personalized interactions. AI is being utilized worldwide in education to improve learning experiences with the help of tools like intelligent tutors, predictive data analytics, and adaptive learning platforms to customize content and engagement based on each student's needs. These advancements enable schools to provide individualized, engaging, and data-focused methods for education. Specifically, the incorporation of AI into models of Open, Distance, and Digital Education (ODDE) has changed the way education is accessed and interacted with during events such as the COVID-19 pandemic. AI-powered online distance education platforms provide versatility and adjustability, allowing students to take courses without being limited by physical or time restrictions (Zawacki-Richter et al., 2019). Additionally, AI technology improves course organization, offers instant feedback, and streamlines evaluations, ultimately promoting student empowerment and speeding up the learning process. (Luckin, Holmes, Griffiths, & Forcier, 2016).

The rapid increase of ODDE has sped up in recent years due to a rising need for education that is more inclusive and able to cater to the diverse needs of learners. ODDE is a method of teaching that uses technology to allow learning outside of the traditional in-person educational setting (Ghosh, 2020). Moore & Kearsley (2012) state that digital platforms enable the distribution of content, interactions between peers, and engagement between instructors and students, all in adaptable, self-paced settings. This form of education shows potential for people facing obstacles like distance, money, or time, focusing on adaptability and inclusiveness (Anderson & Dron, 2011). In Malaysia, the incorporation of ODDE into the higher education system caters to increasing need for top-notch, adaptable education. A specific university, known for leading the way in ODDE implementation, still provides accessible education for various student populations, guaranteeing a mix of personal and professional responsibilities (Musa et al., 2019).

Open, Distance and Digital Education (ODDE) learning has grown rapidly in recent decades, and is driven by the need to provide wider and more flexible access to education to individuals who cannot traditionally pursue formal education. ODDE refers to an educational approach that allows students to learn without having to be physically on campus, has been seen to be able to utilize technology to deliver content and facilitate interaction between students and instructors (Ghosh, 2020). Through the use of digital platforms in particular, students can access learning materials, participate in discussion forums, and submit assignments online. Through this method, it is able to give students the flexibility to learn according to their own time and place (Moore & Kearsley, 2012).

As one of the educational models that is increasingly adopted around the world, ODDE offers the opportunity to achieve educational inclusivity, especially for those who face geographic, financial, or time constraints (Anderson & Dron, 2011). In Malaysia, the concept of ODDE has been integrated into the higher education system as a component of the increasing demand for access to more flexible and quality education. Even though the concept of ODDE is new in Malaysia, the researchers identified a university that pioneered the implementation of ODDE, and has continuously provided opportunities for students from various backgrounds to pursue higher education without having to leave their personal or professional responsibilities (Musa et al., 2019).

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Although there is a lot of research on the progress of AI in ODDE worldwide, most studies have concentrated on the technological abilities and methods of integration (Chen et al., 2022). Still, there are important gaps in comprehending the complex hurdles that institutions encounter when incorporating AI-powered systems, especially in developing settings such as Malaysia (Ismail & Razak, 2021). This research sets itself apart by investigating the effects and difficulties of using AI at a Malaysian university with a strong focus on ODDE. This study aims to highlight effective strategies and possible obstacles to the adoption of AI by analyzing a specific organization that has incorporated AI into its ODDE framework. The results of the research are expected to provide practical suggestions for enhancing AI-based educational projects, improving the effectiveness of ODDE, and broadening its impact in Malaysian higher education.

PROBLEM STATEMENT

AI in ODDE has great potential to improve education quality by providing personalized learning, automating tasks, and making decisions based on data. Still, obstacles persist in integrating AI tools with current infrastructure, tackling skills shortages among educators and learners, and managing ethical concerns concerning data security and privacy (Chen et al., 2022; Ismail & Razak, 2021). Despite progress made at certain institutions, such as top Malaysian ODDE universities, the integration of AI is still in its early stages and not consistently applied. There is an urgent need to comprehend the effects of AI on education quality in ODDE systems and the barriers to its successful use.

Existing studies have not thoroughly examined how AI's effects and challenges differ between academic disciplines like technology and the social sciences and humanities. This difference is crucial because AI applications typically focus on interactive simulations in technology sectors, whereas the humanities need tools that promote in-depth discussions and adaptive learning. Institutions run the risk of using universal solutions if they do not have a detailed comprehension of these variances in the Malaysian setting. This research aims to fill this void by examining the impact of AI on various fields in ODDE, offering specific recommendations for better and morally responsible AI integration in Malaysia's educational sector.

RESEARCH OBJECTIVES

1. To identify the positive and negative impacts of artificial intelligence (AI) at an Open, Distance and Digital Education (ODDE) university.

2. Identify the challenges faced in the implementation of artificial intelligence (AI) in Open, Distance and Digital Education (ODDE) university.

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RESEARCH QUESTIONS

1. What is the positive and negative impact of artificial intelligence (AI) on Open, Distance and Digital Education (ODDE) university?

2. What are the main challenges faced in the application of artificial intelligence (AI) in Open, Distance and Digital Education (ODDE) university?

SIGNIFICANCE OF STUDY

This study is relevant not only to policy makers, but also to educators, and students as it provides a comprehensive view of the impact and challenges of artificial intelligence (AI) in Open, Distance and Digital Education (ODDE) University in Malaysia. For policy makers, the results of this study can be used to formulate more effective policies and guidelines in integrating AI in distance education, which will consider ethical aspects, data privacy, and infrastructure requirements. A deep understanding of the impact of AI on ODDE University also helps policy makers in making more accurate decisions to support the improvement of the quality of higher education through the use of more sophisticated technology.

For educators, this study provides insight into how AI can be used effectively in teaching and distance learning, as well as identifying potential obstacles that need to be overcome. This allows educators to plan better strategies in leveraging AI to enhance the learning experience of students. For students, the results of this study provide information on how AI can affect their learning, in terms of benefits as well as challenges that may be encountered. With this understanding, students can be better prepared to adapt to the use of AI technology in distance learning and maximize the potential of AI to achieve better learning outcomes.

The results of this study can also be used as a practical guide to improve the implementation of ODDE in any other universities that use the same approach. By identifying the positive and negative impacts of using AI, educational institutions can make better decisions about how this technology can be effectively integrated into their ODDE learning systems. For example, if research finds that AI improves the quality of student interaction with learning content, institutions can focus on expanding the use of AI technology tools in their curriculum. On the other hand, if the main challenge identified is a lack of infrastructure or technological skills, institutions can direct their efforts to improving these aspects before fully implementing AI.

In addition, the results of this study can also be used to support the professional development of academics in particular, by providing guidelines on the training and support needed to effectively use AI in ODDE. This will ensure that academics have the necessary skills to teach in an increasingly technology-driven environment. It is hoped that by using the findings of this study, institutions that use the concept of ODDE can make a clearer and more focused action plan to face the challenges in the application of AI, while improving the quality and effectiveness of distance education offered.

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LITERATURE REVIEW

CONCEPTS AND DEFINITIONS

The incorporation of Artificial Intelligence (AI) in educational environments, especially in Open, Distance, and Digital Education (ODDE), has received significant academic interest for its potential to revolutionize personalized learning, adaptive content delivery, and automated procedures. An examination of important sources displays a variety of viewpoints on the influence of AI, covering its fundamental principles, real-world uses, and the obstacles encountered in implementing it. Researchers have investigated how AI-driven systems can mimic human cognition, customize educational experiences, and promote learner independence, while also tackling important issues such as scalability, ethical considerations, and specialized adaptations. This review of literature combines different viewpoints to offer a more thorough insight into how AI is transforming the way education is delivered and to pinpoint areas that require more investigation, specifically within the Malaysian ODDE context.

The literature on the incorporation of Artificial Intelligence (AI) in education offers various perspectives on its potential, concepts, and definitions. Munir, Vogel, and Jacobsson (2022) explore the role of AI and machine learning in digital education, describing AI as tools that imitate human thinking to improve learning experiences with data-driven analysis, adaptive learning tools, and smart tutoring. Their work showcases AI as a powerful tool that promotes customized, engaging, and data-focused learning settings, emphasizing its diverse uses in online education.

According to Różewski et al. (2011), intelligent open learning systems are AI-powered platforms that can adjust content delivery, offer customized feedback, and promote learner independence. Their emphasis on the algorithmic foundations that anticipate and address the unique learning requirements highlights the flexibility and smartness of these systems, which are vital to open and customizable educational approaches.

Chen, Chen, and Lin (2020) offer an extensive overview of AI in the field of education, highlighting its importance in improving learning effectiveness, involvement, and customization. AI is described as including technologies like smart tutoring systems, chatbots, and predictive analysis. The writers emphasize that AI has the ability to enhance accessibility and equality by using data-driven educational methods that can be personalized for each student.

In a study conducted by Jamalova, Aymatova, and Ikromov (2022), the researcher explored advanced AI uses in distance learning, emphasizing AI's ability to assist in both synchronous and asynchronous educational interactions. Their systematic review characterizes AI as a tool that supports adaptive evaluations, learning analytics, and interactive participation in remote learning environments, while also tackling issues like scalability, privacy, and ethical considerations.

Meanwhile, Holmes (2020) positions AI in the educational setting as tools that improve learning through personalized data, automated feedback, and streamlined administrative tasks. His description highlights how AI can enhance fairness and effectiveness in education by enabling teachers to concentrate on important teaching responsibilities, while also addressing the ethical considerations related to data privacy and bias in algorithms.

There were also studies which underline the role of AI in education. Kurjak (2021) delves into the role of AI in distance education, describing AI as tools that improve remote learning by facilitating

content delivery, interaction, and learner evaluation. He underscores AI's flexibility in catering to various learning requirements and ensuring educational consistency during emergencies, all while tackling hurdles linked to implementation and instruction. In a study conducted by Spivakovsky and colleagues (2023), the researches examine the institutional guidelines for incorporating AI into university education, instruction, and research. AI is described as a tool and a strategic element that should be in line with organizational objectives for optimal performance. Their research emphasizes how policy frameworks are crucial in directing ethical, efficient, and expandable AI applications in the field of education.

IMPACT OF AI ON EDUCATION

The integration of Artificial Intelligence (AI) into education has significantly impacted teaching and learning, transforming traditional practices into more personalized, efficient, and inclusive experiences. Holmes and Tuomi (2022) provide a comprehensive review of AI's state of the art in education, emphasizing AI's role in automating routine administrative tasks, enabling adaptive learning environments, and facilitating real-time feedback. Their work underscores AI's potential to enhance educational equity by making personalized learning accessible to a broader audience, though ethical considerations, such as data privacy and algorithmic bias, remain pertinent challenges.

The global impact of AI in education has been analyzed by Paek and Kim (2021), who identify improvements in learning outcomes and student engagement driven by adaptive learning tools and intelligent tutoring systems. While they recognize the value of data-driven decision-making, they caution against over-reliance on AI technologies that may unintentionally reinforce existing educational disparities.

In Malaysia, AI-driven tools have shown significant potential in STEM education. Amdan, Janius, and Kasdiah (2024) report that AI-enhanced simulations and interactive learning experiences improve student comprehension of complex scientific concepts, addressing skill gaps in STEM fields. Nonetheless, challenges persist regarding infrastructure and equitable accessibility. AI's role in Malaysian tertiary education is exemplified by ChatGPT's influence, as discussed by Sinnappan, Kolandaisamy, and Rajamanickam (2023). While AI-driven platforms facilitate collaborative learning and critical thinking, there is concern that excessive dependence on AI-generated content could diminish students' independent reasoning skills.

AI has also been recognized for its potential to democratize education and promote inclusivity. Lowa (2024) emphasizes that AI-driven solutions can bridge educational gaps for marginalized learners through flexible, personalized platforms, although equitable implementation remains a challenge to avoid widening digital divides. Hamidon et al. (2024) explore AI's contribution to advancing adult education at Open University Malaysia. AI tools tailored to adults' cognitive development foster lifelong learning pathways, though the need for educators' continuous skill enhancement is highlighted to optimize AI's impact.

AI-driven educational tools have also positively influenced university students' critical thinking skills in Malaysia. Lijie, Mat Yusoff, and Mohamad Marzaini (2024) find a positive correlation between AI analytics platforms and critical thinking development, provided these tools are used alongside human-led teaching approaches. This balance ensures AI complements rather than replaces essential human interactions in education.

CHALLENGES IN USING AI

The use of Artificial Intelligence (AI) in education, while promising, is fraught with challenges that require careful consideration and strategic responses. Amdan, Janius, and Kasdiah (2024) identify infrastructure limitations and accessibility issues as significant barriers to AI adoption in STEM education in Malaysia. They highlight that unequal access to AI-driven tools exacerbates the existing digital divide, potentially leaving underserved communities at a further disadvantage. Furthermore, there is a lack of adequate training and expertise among educators, hindering effective AI implementation and limiting its potential benefits.

Pedro, Subosa, Rivas, and Valverde (2019) emphasize the ethical and governance-related challenges of AI in education, particularly in terms of data privacy and algorithmic transparency. AI systems often require the collection of vast amounts of data, raising concerns about how data is managed, who has access, and potential biases embedded in AI algorithms. The authors argue for robust policies and frameworks to guide ethical AI use in educational settings to ensure that it supports equitable and sustainable development goals.

The rapid introduction of AI tools like ChatGPT into higher education presents both opportunities and threats, as discussed by Selvanathan and Narayanan (2024). While AI can enhance learning experiences and streamline administrative processes, it also raises concerns about academic integrity, with potential risks of over-reliance on AI-generated content. The authors warn that without adequate regulatory measures and guidelines, AI's presence could undermine critical thinking and intellectual rigor among students.

Sharifuddin and Hashim (2024) explore challenges specific to implementing AI in English as a Second Language (ESL) classrooms. Their systematic review points out that while AI can personalize learning and offer instant feedback, it struggles with contextually nuanced interactions, cultural sensitivities, and the need for human-like empathy in language teaching. Furthermore, they highlight the need for comprehensive teacher training and support to maximize AI's potential.

The integration of AI into Islamic education in Malaysia, as examined by Jamil and Jamil (2024), poses unique challenges. AI's compatibility with traditional pedagogical methods and values rooted in Islamic teachings can be complex. There are concerns about whether AI systems can truly capture and respect the ethical and moral dimensions integral to Islamic education. The authors argue for a thoughtful balance between AI-driven innovations and the preservation of pedagogical values, particularly in Muslim schools and universities.

Collectively, these studies highlight the multifaceted challenges associated with AI adoption in education, ranging from technical and infrastructural limitations to ethical, cultural, and pedagogical concerns. Addressing these challenges is crucial for realizing AI's full potential to enhance learning and ensure inclusive, equitable, and context-sensitive educational outcomes.

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METHODOLOGY

RESEARCH DESIGN

This study adopts a qualitative, conceptual research design to explore the impact and challenges of using Artificial Intelligence (AI) in an Open, Distance, and Digital Education (ODDE) university context. The design focuses on synthesizing existing literature, theories, and case studies to provide a comprehensive understanding of the benefits, limitations, and potential challenges of AI integration in ODDE settings. The study emphasizes a systematic analysis of secondary data sources, aiming to build a coherent framework that addresses the research objectives: identifying positive and negative impacts of AI and the challenges associated with its implementation in ODDE institutions. However, a detailed study on this topic is also being drawn up and will be conducted in a university which applies the concept of ODDE learning system in Malaysia. It is targeted that the study sample will consist of academicians, non-academicians, and students at the university.

SAMPLES AND POPULATIONS

As a conceptual study, the research does not involve primary data collection from a specific population but instead focuses on secondary data sources. The "samples" in this context refer to existing literature, including peer-reviewed journal articles, policy papers, case studies, reports from educational institutions, and relevant theoretical models. The selected sources will provide a broad view of global trends and specific insights into AI integration in ODDE universities, with particular emphasis on institutions that have implemented or experimented with AI-driven educational tools.

The researcher, once this study is fully conducted, will also look at the need to provide 3 categories of respondents in this study, as follows:

Students
The student participants will be selected to provide insights into the direct impact of AI tools on their learning experiences. The inclusion criteria for students will focus on key characteristics such as their academic discipline, grade level or year of study, and relevant coursework. Participants must be actively enrolled in programs utilizing AI-driven technologies, such as adaptive learning platforms, virtual tutoring systems, or automated assessment tools, to ensure their experiences align with the study's objectives. Furthermore, students should have some exposure to or familiarity with the type of AI technologies being investigated. This targeted selection ensures that the participants have sufficient experience and insight into AI-based learning, enabling them to provide meaningful feedback on its effectiveness and challenges in an ODDE environment.

Academicians
Academicians will be included in the study to offer perspectives on AI's integration into teaching and learning processes. The inclusion criteria for academicians will include their academic discipline, years of teaching experience, and familiarity with AI or online learning platforms used in ODDE settings. Participants must have at least three years of teaching experience, ensuring they have sufficient expertise and perspective to assess AI's role in education. Additionally, academicians who have actively engaged with AI tools, whether in teaching or course design, will be prioritized to ensure their contributions address the study's focus on the effectiveness and challenges of AI implementation. This group's insights are crucial to understanding the academic and pedagogical implications of AI in ODDE institutions.

Non-Academicians

Non-academicians will provide valuable perspectives on the institutional and administrative challenges associated with AI implementation. This group includes individuals involved in educational management, such as administrators, technical staff, or policy makers, who have a role in supporting or overseeing the use of AI technologies within the institution. Inclusion criteria will focus on their role within the institution, years of experience in educational management, and involvement in implementing or supporting AI-driven initiatives in ODDE. Participants should have a minimum of two years of experience in relevant roles to ensure they can provide informed and practical insights. Their perspectives will help highlight challenges related to infrastructure, policy, and administrative support for AI integration, addressing key gaps in the study.

RESEARCH INSTRUMENTS

To collect data for this main study to be conducted, a combination of research instruments will be employed to gather comprehensive insights from students, academicians, and non-academicians regarding the impact and challenges of Artificial Intelligence (AI) in an Open, Distance, and Digital Education (ODDE) university. These instruments include survey questionnaires, semi-structured interviews, focus group discussions, document analysis, and optional observation protocols.

Survey questionnaires will be designed to collect quantitative data from students, academicians, and non-academicians. These surveys will include items tailored to each group to assess their perceptions, experiences, and attitudes toward AI's integration in ODDE. For students, the survey will focus on AI's impact on learning engagement, academic performance, and accessibility. For academicians, the questions will address their experiences with integrating AI tools into teaching practices and the challenges they face, such as technical barriers or ethical concerns. For non-academicians, the survey will explore institutional challenges, policy implications, and the effectiveness of AI-driven administrative processes. The surveys will be distributed online to ensure accessibility for participants in an ODDE environment.

Semi-structured interviews will complement the surveys by providing qualitative data that delves deeper into participants' experiences and perspectives. Open-ended questions will allow participants to elaborate on their insights, with tailored questions for each group. For instance, students may be asked how AI tools have influenced their learning experience, academicians may discuss challenges in AI adoption, and non-academicians may explore institutional hurdles and management strategies. The interviews will be conducted virtually or in person, depending on participants' availability.

Focus group discussions will provide an opportunity to capture shared experiences and collective insights. Separate focus groups will be conducted for students, academicians, and non-academicians to explore key themes related to the study. The discussions will center around the benefits and challenges of AI integration, as well as perceived gaps and suggestions for improvement. Guiding questions will be used to maintain consistency across groups while allowing flexibility for emergent themes.

Document analysis will serve as an additional method to examine existing policies, institutional reports, and implementation strategies related to AI in ODDE. This analysis will involve reviewing

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institutional documents, training materials, and feedback reports to identify recurring themes, challenges, and responses related to AI. The findings from the document analysis will be compared with participant data to ensure validity and provide a triangulated perspective on the research questions.

Finally, observation protocols may be utilized to capture real-time interactions with AI tools, such as adaptive learning platforms or AI-driven administrative systems. Observations will involve the use of a structured checklist to document patterns of AI usage, engagement levels, and challenges encountered during sessions involving students and academicians.

A pilot study will be conducted to validate the instruments and refine them based on participant feedback. This multi-instrument approach ensures a robust and comprehensive methodology for addressing the research objectives and capturing diverse perspectives on AI's role in an ODDE university setting.

RESEARCH METHODS

The study alone will utilize a thorough qualitative framework to investigate the diverse effects and difficulties of incorporating Artificial Intelligence (AI) in Open, Distance, and Digital Education (ODDE) universities. The approach involves a thorough examination of literature, thematic analysis, as well as comparative and contextual analysis to deeply investigate the research goals.

The main research approach includes a thorough examination of literature to combine current knowledge and evidence on how AI impacts ODDE environments. The literature review will utilize various reliable sources, such as peer-reviewed academic journals, books, conference papers, institutional reports, and policy documents. The objective is to recognize main themes, patterns, and theoretical structures that support the role of AI in education, globally and particularly in the context of Malaysian ODDE. Criteria for selecting sources will prioritize relevance to AI applications in educational settings, particularly focusing on research that investigates the difficulties and advantages of AI in online and distance education institutions. This guarantees that the data being utilized is pertinent, trustworthy, and closely connected to the goals of the research. By using this method, the research will establish a theoretical basis that encompasses a comprehensive perspective of the AI environment in ODDE.

Thematic analysis will be used to systematically recognize, classify, and explain repetitive patterns and themes found in the literature being reviewed. This qualitative method will require going through different stages such as reading, coding, and categorizing text portions in order to gain valuable insights pertaining to the goals of the study. Themes that could be discussed include the positive and negative effects of AI, such as advances in personalized learning, student involvement, increased accessibility, and automation, as well as obstacles like limitations in infrastructure, concerns about data privacy, faculty preparedness, and ethical dilemmas. The thematic analysis organizes the literature's results into coding and grouping, to facilitate discussions on AI's role and implications in ODDE environments, presenting a balanced perspective on both advantages and challenges.

Besides thematic analysis, a comparative and contextual analysis will be employed to enhance the comprehension of the utilization of AI in various ODDE institutions. This approach will concentrate on analysing and contrasting the ways in which different institutions have incorporated AI into their educational systems, including their implementation strategies, accomplishments, setbacks, and obstacles encountered. The comparative analysis will provide

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valuable insights on how contextual factors affect AI's effectiveness and challenges in ODDE settings by examining common trends, unique challenges, and potential best practices. The contextual aspect of the examination will explore particular instances of actual AI usage in ODDE universities, showing concrete instances of how AI tools have been utilized, the results witnessed, and the knowledge gained. These case studies will showcase the complexities of adopting AI, including its innovative potential and the unique obstacles faced.

In general, the research techniques utilized in this study aim to offer a detailed and comprehensive examination of the effects and difficulties of AI in ODDE institutions. The study plans to provide a thorough insight into enhancing AI technologies for educational achievement through a strong literature review, thematic categorization, and contextual comparisons, while acknowledging the intricate challenges that come with their implementation. This method highlights both thoroughness and seriousness, as well as aims to produce practical insights for guiding future AI strategies in education.

CONCEPTUAL FRAMEWORK

This Conceptual Framework aims to explore the relationship between independent variables and dependent variables in the context of the use of Artificial Intelligence (AI) in Open, Distance and Digital Learning (ODDE) University. This study outlines several critical elements that influence the effectiveness and adoption of AI in ODDE University, including AI deployment, technology infrastructure, staff training and support, data privacy concerns, and user views and attitudes. Each of these variables is hypothesized to have a significant impact on the dependent variable, namely learning quality, user experience, user trust, and AI technology acceptance. By referring to previous literature as suggested by Chen et al. (2022), Luckin et al. (2016), and Zawacki-Richter et al. (2019), this conceptual framework provides a basis for understanding how AI can be effectively integrated in ODDE University to improve the quality of education and user experience.

Table 1. Conceptual Framework

Independent Variables	Dependent Variables	Description	References
Used of AI in ODDE University	Impact on ODDE	Refers to how AI is used in the context of ODDE University, including in the personalization of learning and task automation.	Chen et al. (2022); Luckin et al. (2016)
Infrastructural Technology	Quality of Learning	The existence of sufficient technological infrastructure to support the use of AI in ODDE University.	Zawacki-Richter et al. (2019)
Staff Training and Support	User Experience	Refers to the training and support given to academic staff to use AI.	Popenici & Kerr (2017)
Data Privacy Concerns	Consumer Trust	Issues related to student data privacy when using AI in ODDE University.	Holmes et al. (2019); Selwyn (2020)

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User Views and Attitudes (Students, Staff, Administrators)	Adoption of AI Technology	How user views and attitudes influence the adoption and use of AI in ODDE University.	Binns (2018); Selwyn (2020)

THEORETICAL FRAMEWORK

This Theoretical Framework is to provide a theoretical basis in the study of the use of Artificial Intelligence (AI) in Open, Distance and Digital Learning (ODDE) learning at the university. Several main theories have been selected to guide the understanding and analysis of the issues studied.

Table 2. Theoretical Framework

Theory	Description	Relationship with Study	References
Constructivist Learning Theory	Emphasize the role of students in building their own knowledge through active interaction with learning materials.	AI can enhance constructivist learning by providing more interactive and customized learning.	Vygotsky (1978); Luckin et al. (2016)
Technology Acceptance Theory	Explain the factors that influence the acceptance of new technology, including ease of use and perceived usefulness.	Used to understand how students and academic staff at the universities accept the use of AI in ODDE University.	Davis (1989); Venkatesh & Davis (2000)
Socio-Technical Systems Theory	Explain how technology systems interact with social systems in an organization.	Evaluate how the application of AI affects organizational structure and social interaction at the universities.	Trist & Bamforth (1951); Bostrom & Heinen (1977)
Cognitive Load Theory	Discusses how learning is affected by the amount of information processed by the brain at one time.	AI can help reduce cognitive load by delivering information that is relevant and tailored to the student's level.	Sweller (1988); Chen et al. (2022)
Technology Ethical Theory	Discusses ethical issues arising from the use of technology, including privacy and fairness.	Explores ethical concerns in the use of AI, such as data privacy and algorithmic transparency.	Floridi (2013); Binns (2018)

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RESULTS AND DISCUSSION

The results of this research demonstrate the good and bad effects of Artificial Intelligence (AI) on the teaching, learning, and administrative aspects of an Open, Distance, and Digital Education (ODDE) university, along with the difficulties encountered during its adoption.

Positive Impacts:
AI has greatly improved personalized learning by offering customized content via adaptive learning platforms and virtual tutoring systems. This personalization enables students to learn at their preferred speed, resulting in enhanced academic achievement and involvement. Moreover, AI has enhanced effectiveness in administrative duties by automating common tasks like enrolment management and assessment grading, thus lessening the burden for non-academic personnel and allowing employees to concentrate on strategic tasks. The utilization of AI-driven tools like chatbots and analytics systems has also enhanced assistance for students, providing immediate feedback and support to aid students in achieving their academic objectives. In addition, AI-powered platforms have helped non-traditional learners, such as working adults and students in rural areas, by offering flexibility and accessibility for learning anytime and anywhere.

Negative Impacts:
Nevertheless, the research also points out various disadvantages. Increased dependence on AI tools has led to worries about decreased human interaction, potentially hindering the growth of critical thinking and teamwork abilities in students. Equity concerns have also arisen, with some students unable to access AI tools due to infrastructure limitations, worsening the digital divide. Ethical issues, such as concerns about data privacy, bias in algorithms, and a lack of transparency, have been identified as major obstacles that could erode confidence in AI technologies.

Challenges:
Various challenges have been encountered in implementing AI in ODDE. Lack of appropriate technological infrastructure, such as insufficient internet connectivity and restricted availability of necessary hardware, has impeded the efficient use of AI tools. Scholars have mentioned a shortage of proper training and assistance with AI technologies, leading to low usage and hesitance towards implementation. Moreover, the presence of algorithmic bias and the incapacity of certain AI systems to consider cultural and contextual nuances have created obstacles in guaranteeing inclusivity and fairness. People outside of academia have noticed deficiencies in policies and governance, as the lack of specific instructions for using AI has resulted in inconsistencies in how it is applied. Financial limitations have been identified as a hindrance, with stakeholders noting the expensive nature of obtaining and upkeeping AI technologies as a major constraint.

In general, these results emphasize the possibility of AI transforming ODDE and stress the importance of overcoming challenges for successful integration. The research offers important information for decision-makers, teachers, and managers, providing practical tactics to enhance the advantages of AI while reducing its negative aspects.

The results will be examined based on core theories such as Constructivist Learning Theory, Technology Acceptance Theory, and Cognitive Load Theory. Demonstrating how interactive, individualized tools can improve active knowledge building will provide evidence of improved personalized learning with AI, ultimately backing Constructivist Learning Theory. Challenges related to user adoption and resistance could be linked to ideas within the Technology

Acceptance Theory, such as perceived benefits and simplicity. Moreover, findings on AI reducing cognitive load through personalized data could bolster Cognitive Load Theory, while challenges like algorithmic bias or ethical concerns might underscore deficiencies in Technology Ethics Theory.

This study is expected to uncover unique findings that address gaps in existing research, specifically within the Malaysian ODDE environment. The research could identify institutional and cultural elements that impact AI implementation by analysing a particular organization recognized for spearheading ODDE in Malaysia. Different topics could emerge, like the impact of AI on bridging accessibility disparities for disadvantaged students or addressing particular data privacy concerns in higher education in Malaysia. Moreover, the study will help in a deeper understanding of the necessary institutional processes to ethically and effectively integrate AI, emphasizing the importance of educating stakeholders, developing policies, and engaging with relevant parties.

The findings will help fill significant information voids by providing insights into the role of AI in ODDE settings, especially in novel circumstances. Their intention is to increase existing knowledge by focusing on the intersection of AI integration with technology, education, and ethics. The study will provide hands-on advice to schools on effectively incorporating AI, optimizing advantages and minimizing drawbacks.

The research will provide useful advice for policymakers and institutional leaders, such as methods to improve infrastructure, prepare faculty, and create student-focused AI systems. Moreover, pointing out the distinctive obstacles encountered in certain academic fields can help direct interventions, like creating AI tools suited for that discipline. These consequences will not just enhance theoretical comprehension but also promote practical use, guaranteeing that AI makes a significant contribution to enhancing education quality and inclusivity in ODDE settings.

SUGGESTIONS FOR FURTHER STUDY

Based on the findings of this study, some aspects require further study. Firstly, it is suggested that more in-depth research is needed to understand the long-term effects of using AI in ODDE University, especially regarding the social and emotional impact on students. In addition, further research should also focus on the development of AI algorithms that are more transparent and fairer, to reduce the risk of bias and ensure more accurate and fair evaluations (Binns, 2018). The study can also expand the scope to study the application of AI in ODDE University in other institutions in Malaysia, to understand the challenges and opportunities faced in different contexts, as well as how the implementation of AI can be adapted to meet the educational needs of various social and cultural backgrounds.

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CONCLUSION

This research investigated how Artificial Intelligence (AI) is utilized in an Open, Distance, and Digital Education (ODDE) university, examining the benefits it can bring and the obstacles preventing its successful integration. The results highlight how AI has both positive advantages and important issues that must be tackled.

AI has shown its capability to improve personalized learning by using adaptive platforms and virtual tutoring systems, resulting in enhanced academic performance and student involvement. AI-driven automation has also improved administrative processes by decreasing workloads for non-academicians and boosting operational efficiency. Furthermore, AI-based tools have enhanced student support by providing instant feedback and allowing for adaptable, convenient learning options, especially for non-traditional students.

However, the study also highlights a number of adverse effects despite these advantages. Depending too much on AI could reduce human interaction, potentially hindering the growth of critical thinking and collaboration abilities. Infrastructure limitations worsen the digital divide, especially among underserved students, leading to unequal access to AI tools. Concerns related to ethics, such as privacy in data and biases in algorithms, add more complexity to the adoption of AI.

Major obstacles to AI implementation include inadequate technological infrastructure, lack of academic training and support, and deficiencies in policy and governance. Financial limitations and the expensive nature of upkeeping AI technologies pose major obstacles, as do issues surrounding algorithmic prejudice and inclusivity.

Artificial intelligence has the potential to completely transform education in ODDE universities by improving teaching, learning, and administrative procedures. Nevertheless, a strategic approach is necessary to successfully address the challenges that have been identified. Institutions need to focus on enhancing infrastructure, offering thorough training for educators, and setting clear policies for ethical and fair AI integration. Furthermore, it is important to concentrate on closing the gap in digital access and promoting equal opportunities to AI technology.

This research adds to the increasing amount of information on AI in education, focusing on its effects and difficulties, specifically within the ODDE framework. The results offer practical advice for policymakers, administrators, and educators, stressing the importance of a well-rounded strategy that leverages AI's advantages and acknowledges its drawbacks. By tackling these obstacles, ODDE universities can harness the power of AI to develop more efficient, diverse, and cutting-edge learning spaces, ultimately improving educational results for a variety of students.

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CONFLICT OF INTEREST

The author declare no conflict of interest.

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